IN THE CLAIMS

1. (currently amended) A method of protecting an MR imaging magnet including a plurality of coil groups, said method comprising:

connecting at least one first diode between terminals of a first coil group;

connecting at least one second diode between terminals of a second coil group, wherein the second group is connected to the first coil group via a separation line; and

connecting at least one quench heater ~~between~~with the separation line and with the first and second diodes, wherein a voltage across the first coil group is equal to a sum of voltages across the at least one first diode and the at least one quench heater, and wherein an amount of current flowing through the at least one quench heater is different than an amount of current flowing through the at least one first diode.

2. (original) A method in accordance with Claim 1 wherein said connecting at least one first diode between terminals of a first coil group comprises connecting at least one first diode between terminals of a first coil group, wherein the first coil group comprises at least a portion of a main coil and at least a portion of a shielding coil.

3. (canceled)

4. (currently amended) A method in accordance with ~~Claim 3~~Claim 1 further comprising connecting at least one dump resistor in series with ~~at least one of~~ the first ~~and second~~ diode.

5. (currently amended) A method in accordance with Claim 1 further comprising connecting at least one dump resistor in series with ~~at least one of~~ the ~~first and~~ second diode.

6. (original) A method in accordance with Claim 5 further comprising connecting at least one shunt resistor in parallel with the quench heater.

7. (original) A method in accordance with Claim 5 further comprising connecting at least one protecting diode in parallel with the quench heater.

8. (original) A method in accordance with Claim 1 further comprising connecting at least one shunt resistor in parallel with the quench heater.

9. (original) A method in accordance with Claim 1 further comprising connecting at least one protecting diode in parallel with the quench heater.

10. (original) A method in accordance with Claim 1, wherein said connecting at least one first diode between terminals of a first coil group comprises connecting at least two first diodes between terminals of the first coil group such that one first diode is positioned with a polarity opposite a polarity of another first diode, wherein said connecting at least one second diode between terminals of a second coil group comprises connecting at least two second diodes between terminals of the second coil group such that one second diode is positioned with a polarity opposite a polarity of another second diode.

11. (currently amended) A method for adjusting energy input to a quench heater, said method comprising:

connecting at least one diode in series ~~or parallel~~ with ~~the quench heater and in parallel with at least one coil~~a dump resistor; and

connecting ~~at least one shunt resistor in series with the diode to adjust energy input to the~~a quench heater, the at least one diode, and the dump resistor in parallel with a coil group of a magnetic resonance imaging system, wherein a voltage across the coil group is equal to a sum of voltages across the quench heater, the at least one diode, and the dump resistor.

12. (currently amended) A method for adjusting a current flowing through a coil quench heater, said method comprising:

connecting at least one quench heater to a coil separation line separating ~~at least one~~a first coil group from ~~another coil group such that the quench heater is in parallel to at least one coil group; and~~a second coil group;

connecting at least one shunt resistor or protecting diode in parallel to the quench heater to adjust the current flowing through the coil quench heater; and

connecting a quench protection diode and the at least one quench heater in parallel with the first coil group, wherein a voltage across the first coil group is equal to a sum of voltages across the quench protection diode and the at least one quench heater, and wherein an amount of current flowing through the at least one quench heater is different than an amount of current flowing through the quench protection diode.

13. (currently amended) A quench protection circuit comprising:

a first coil group;

a second coil group;

a coil separation line connecting said first group to said second group;

a first quench heater connected to said coil separation line; and

a first diode ~~in series with said first quench heater such that said first diode~~ and said first quench heater are coupled in parallel ~~at least one of~~with said first coil group ~~and said second coil group~~, wherein a voltage across the first coil group is equal to a sum of voltages across the first diode and the first quench heater, and wherein an amount of current flowing through the first quench heater is different than an amount of current flowing through the first diode.

14. (currently amended) A circuit in accordance with Claim 13 further comprising a second diode ~~positioned in series~~coupled with said first quench heater such that said second diode and said quench heater are parallel ~~at least one of said first coil group and~~to said second coil group, wherein said second diode is ~~parallel with respect to said first diode and~~ positioned with a polarity opposite a polarity of said first diode.

15. (currently amended) A circuit in accordance with Claim 14 further comprising:

a second quench heater connected to said coil separation line, and

a third diode ~~in series with~~coupled to said second quench heater such that said third diode and said second quench heater are parallel said second coil group~~, wherein said first diode and said first quench heater are parallel said first coil group~~.

16. (original) A circuit in accordance with Claim 15 further comprising at least one shunt resistor connected to said coil separation line in parallel to said first quench heater and said second quench heater.

17. (original) A circuit in accordance with Claim 16 wherein the first coil group comprises at least a portion of a main coil and at least a portion of a shielding coil.

18. (original) A circuit in accordance with Claim 13 wherein the first coil group comprises at least a portion of a main coil and at least a portion of a shielding coil.

19. (currently amended) A circuit in accordance with Claim 18 further comprising:

a second quench heater connected to said coil separation line, and

a second diode ~~in series~~coupled with said second quench heater such that said second diode and said second quench heater are parallel said second coil group~~,~~ ~~wherein said first diode and said first quench heater are parallel said first coil group~~.

20. (currently amended) A circuit in accordance with Claim 13 further comprising:

a second quench heater connected to said coil separation line, and

a second diode ~~in series~~coupled with said second quench heater such that said second diode and said second quench heater are parallel said second coil group~~,~~ ~~wherein said first diode and said first quench heater are parallel said first coil group~~.

21. (currently amended) A circuit in accordance with Claim 20 further comprising a third diode ~~positioned in parallel~~coupled with said second quench heater

such that said third diode and said second quench heater are parallel said second coil group, wherein said second diode is ~~parallel said first diode and~~ positioned with a polarity opposite a polarity of said first diode.

22. (currently amended) A circuit in accordance with Claim 13 further comprising ~~at least one of:~~

~~a shunt resistor positioned in series with the first diode to adjust energy input to the first quench heater, and~~

a shunt resistor positioned in parallel to the first quench heater to adjust the current flowing through the quench heater.

23. (currently amended) A magnetic resonance imaging (MRI) system comprising:

a radio frequency (RF) coil assembly for imaging a subject volume;

a computer coupled to said RF coil, said computer configured to generate images of a scanned object; and

a magnetic resonance imaging magnet having a quench protection circuit, said quench protection system comprising:

a first coil group;

a second coil group;

a coil separation line connecting said first group to said second group;

a first quench heater connected to said coil separation line; and

a first diode ~~in series with said first quench heater such that said first diode~~ and said first quench heater are coupled in parallel ~~at least one of~~with said first coil group ~~and said second coil group~~, wherein a voltage across the first coil group is equal to a sum of voltages across the first diode and the first quench heater, and wherein an amount of current flowing through the first quench heater is different than an amount of current flowing through the first diode.

24. (currently amended) A method ~~of protecting an MR imaging magnet including a plurality of coil groups, said method comprising providing a quench protection circuit configured such that~~in accordance with Claim 1 wherein the first and second coil groups have a substantial zero eddy current time constant.

25. (currently amended) A method of protecting an MR imaging magnet including a plurality of coil groups including a first coil group and a second coil group, said method comprising ~~providing a quench protection circuit configured such that~~:

connecting a first diode with the first coil group;

connecting the second coil group with the first coil group via a separation line; and

connecting a quench heater with the separation line and with the first diode, wherein a voltage across the first coil group is equal to a sum of voltages across the first diode and the quench heater, and wherein an amount of current flowing through the quench heater is different than an amount of current flowing through the first diode, and wherein the first and second coil groups have substantially no unbalanced quench forces during quench events.

26. (currently amended) A method ~~of protecting an MR imaging magnet including a plurality of coil groups, said method comprising providing a quench protection circuit configured such that~~in accordance with Claim 1 wherein the first and second coil groups have substantially small fringe field blooming during quench events.